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Date: April 10, 2003

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Study Confirms that Gulls Contributed to Lake Michigan Beach Closings Last Summer

A study has found that gull feces were the predominant source of the high bacteria counts that consistently closed beaches at nine Lake Michigan beaches in Lake County last summer. Human/sewage was also found as a source at one of the beaches.

“We had previously correlated gull counts to *E. coli* bacteria concentrations, but could not ascertain if the gulls were the only or primary source of the high counts,” said Mark Pfister, an aquatic biologist at the Lake County Health Department/Community Health Center. “The study provided us with the answers to move forward and help correct the problem, since the gulls are the primary source.”

Last summer, over 200 beach closings occurred at the nine Lake County, Lake Michigan beaches due to high bacteria counts. Two beaches in particular, North Point Marina and Waukegan South beaches, were closed over 50 percent of the time.

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In August of 2002, Health Department staff initiated a bacterial source tracking study to determine other possible sources responsible for the high bacteria counts at four Lake County beaches (Highland Park Rosewood beach, Lake Forest Forest Park beach, North Point Marina beach and Waukegan South beach) which was funded by the North Shore Sanitary District. Bacterial source tracking (BST) is a new scientific pursuit that attempts to identify the sources of fecal bacterial contamination in water. Current BST methods can be divided into DNA based and non-DNA based. DNA based methods are known as DNA typing or fingerprinting, which is what forensic scientists use. The main objective of this study was to compare the DNA of bacteria from beach water with those of suspected known sources for source tracking purposes.

Health Department staff collected over 100 feces samples from gulls and numerous water samples from the four beaches and at two streams at the point of entry into Lake Michigan from August to November of 2002. From these samples, over 400 *E. coli* isolates (100 known and 300 unknown) were sent to Purdue-Calumet University for DNA analysis. Based on this DNA analysis, the source of the bacteria matched predominantly to gulls. At Waukegan South beach almost 55 percent of the unknown samples matched gulls. At Highland Park Rosewood beach over 46 percent of the unknown samples matched gulls, but 17 percent matched human/sewage, which may be indicative of

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sanitary and storm sewer cross connections or fecal collection from watershed runoff.

Several other animal or wildlife species were identified, however the number of matches were too low to be of significance.

Now that the possible sources have been determined, the Health Department will be recommending to the management entities of the beaches solutions to reduce the high bacteria problems. The first is to educate the public to not feed the gulls or other waterfowl and to pick up and properly discard food that may be attracting large numbers to the beach area. Other recommendations include erecting educational signs at the beach with “do not feed the waterfowl,” and distributing pamphlets/fact sheets explaining the relationship between beach closings and gulls.

Additionally, manual raking and removal of feces from the beach and timely refuse removal will be highly recommended. If the bacterial concentrations continue to be problematic, the Health Department will recommend gull harassment by propane cannons or digital distress calls as a secondary option. For beaches that have been identified with some human/sewage matches, the Department will recommend infrastructure testing of the sanitary sewers by the municipalities in the drainage area of the beach to ensure that no cross connections or leaks exist.

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